EVERY WORKER'S GUIDE TO

HEIGHT SAFETY ESSENTIALS

DEVELOPED IN THE INTEREST OF WORKER SAFETY BY
THE FALL PROTECTION EXPERTS.

capital SAFETY

CONTENTS

This booklet is written as an introductory guide to height safety. Use it when evaluating your fall protection requirements, however, always consult a fall protection specialist if you're unsure of any aspect of fall protection or fall protection equipment.

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THE A,B,C,D OF FALL PROTECTION

The A,B,C,D of Fall Protection covers the fundamental requirements of every personal fall protection system.

Anchorage

Anchorage provides a secure point of attachment (to an existing structure) for the fall arrest system. Anchorage devices can be permanent or temporary and vary to suit the type of structure available.

Body support

Full body harnesses connect the worker to the fall arrest system. They are specially designed to protect the worker against serious injury in the event of a fall whilst also remaining comfortable to wear.

Connectors

Connectors are devices that connect the full body harness to the anchorage system. They can be single products or multiple devices working together.

Descent/rescue

Descent & Rescue systems enable the retrieval of an injured or incapacitated worker. In the event of a rescue, this equipment facilitates rapid recovery of the worker without endangering other workers in the process.

DBI SALA PROTECTA

12 FUNDAMENTAL FACTS OF FALL PROTECTION

1 Gravity never takes a rest

A person can always:

- Fall through a gap or weak surface
- Fall over an edge, or
- Trip or slip down a slope

Gravity is there waiting for your "bad day" when you have a momentary "slip up".

2 It is not the fall that causes the death or injury

Injury is caused by the shock of suddenly stopping, or hitting objects or the ground during the fall.

If there is any risk of a fall, consideration should be given to clearance distances and the pendulum effect.

Australian and New Zealand Standards requires that when using a fall arrest system, the maximum fall arrest force that a person can be exposed to is 6kN (611kg).

3 Falls from height represent 16% of all fatalities in the workplace in Australia*

- 39% of these fatalities were in the construction industry
- Most fatal falls are from roofs, scaffolding and ladders

*Source: Safe work Australia - Notified Fatalities Statistical Report 2009-2010.

4 Writing a fall protection plan helps prevent fall-related injuries

An effective fall protection plan uses:

- Levels of control. This is called a hierarchy of control. It uses administrative (such as a "lock out" system) and engineering control measures. These measures are elimination, substitution, isolation and fall protection
- Hazard & Risk assessment. This is the investigation of the likelihood of an accident or injury occurring, versus the severity of the injury

Hazards need to be identified, assessed, evaluated, then eliminated or controlled. Australian and New Zealand Standard AS/NZS 4360 gives guidance on risk management. Risk assessment and control measures help decide:

- What hazards are involved with the task and who could be affected by the dangers
- What instructions (including rescue) need to be written
- What equipment needs to be used
- What training is necessary

The best type and combination of equipment that should be used can be very specific to the actual height safety situation. AS/NZS 1891.4 gives guidance on equipment selection for the right situation.

Fall protection plans are similar to work method statements. Work method statements should be clear, to the point and if helpful, include sketches.

If in doubt ask! A competent person must perform the risk assessment. You can become competent through a combination of reading, comprehending, gaining practical experience, observing and completing training. It's the law! See Fundamental Fact #12, on page 9.

DBI SALA PROTECTA

5 There is no such thing as a safe distance to fall

The further you fall, the faster your speed of descent and the higher the total forces that the safety system needs to absorb to prevent injuries. The further you fall, the more likely you are to hit the ground, or swing into a wall or hit the nearest obstacle below you.

You should use work-in-restraint techniques to remove the possibility of a fall, or to maintain a fall distance of less than 2 metres. You must never put yourself in a situation where you can free fall more than two metres.

Refer to the Shock Absorbing Lanyard and Self Retracting Lifeline Fall Clearance Calculations on pages 10 and 11.

6 You must be connected to a structure using your safety system at all times

Using double-action or triple-action connectors on your shock absorbing system helps prevent metal components from disconnecting.

Unintentional disconnection of hardware by itself is called forced rollout.

Do not disconnect from one safety system, unless you have connected to another or are in a secure location.

7 The anchor/connection point you connect to must be very strong

The anchorage you use must be capable of holding the weight of a family sized car. This is equal to at least 15kN (1,500kg), as required by AS/NZS 1891.4 for a single person anchorage, or 21kN for a 2 person anchorage point. The structure should be free from burrs and sharp edges that might damage your equipment when in use.

8 A belt should never be used for fall arrest or limited free fall

Belts are no longer recognised by Australian and New Zealand Standards as a legitimate fall protection device. A harness is better for any work situation where you can slip, trip, slide or fall. A full body harness distributes the fall arrest forces better around the body. A belt should never be used in a fall arrest situation.

9 The harness must be fitted and adjusted correctly

All safety equipment shall be used according to the instructions supplied by the manufacturer. Correct fitting and adjustment better distributes forces of a fall impact and lowers the risk of injury.

10 It is too late to plan a rescue after somebody has fallen and they are suspended in mid-air

The ability for a worker to hang in a fall arrest harness after a fall is limited if they are unconscious. Most standards worldwide recognise the need for a timely rescue within 15-30 minutes.

An effective rescue plan will ensure that there are procedures put into place to adopt in an emergency. Effective rescue can be performed by fellow workers if they are well trained. Safety first - do not put yourself at risk to save another person.

11 The inspection and maintenance instructions of height safety systems and equipment must be understood and followed

Inspection frequency requirements must be followed according to AS/NZS 1891.4 and the manufacturer's user instructions. All inspection and maintenance data must be recorded in an inspection and maintenance log kept by the company.

All fall protection equipment must be inspected prior to and after each use by the user and periodically by a height safety equipment inspector as defined by Australian Standard AS/NZS 1891.4*. Australian and New Zealand Standards provide guidelines for the frequency of inspection, as does local OH&S legislation.

Australian and New Zealand Standards also require that all fall arrest devices such as SRLs be subjected to a full inspection and service by factory Accredited Service Centres, or every 12 months in the absence of any instructions/recommendations from the manufacturer.

They must also be re-certified by the manufacturer or their accredited service agent after they have been used to arrest a fall.

* **Note:** AS/NZS 1891.4 defines a competent person as: A person who has, through a combination of training, qualification and experience, acquired knowledge and skills enabling that person to correctly perform a specified task. Levels of competency are now defined in the informative appendix in AS/NZS 1891.4, refer to the definitions in the Glossary, on page 28.

12 You must be competently trained

If you are required to perform any tasks at height, you must be competently trained as per AS/NZS 1891.4.

A successful fall protection training program should cover the following:

- Requirements of standards and legislation
- Identification of relative hazards
- Application of the hierarchy of control and other measures to minimise and control risk
- Rescue plans and procedures
- The use, fit, inspection and maintenance of fall protection equipment

When selecting your training provider, ensure they are a Registered Training Organisation (RTO) certified and accredited under the AQTF. This is an indicator that the organisation is a credible training provider that meets nationally recognised standards. Also, choose a course that carries a competency relevant to the work tasks being completed.

All employers and employees have a duty of care to maintain a safe working environment.

Workers must be competently trained to identify the hazards and when required, use fall protection equipment and systems safely, to reduce or eliminate the risk of injury.

This guide is not a substitute for competent training. Capital Safety offers a range of internationally accepted courses nationally recognised under VETAB, refer to page 18 for more information.

FALL CLEARANCE & SWING FALL HAZARDS

SHOCK ABSORBING LANYARD FALL CLEARANCE CALCULATION

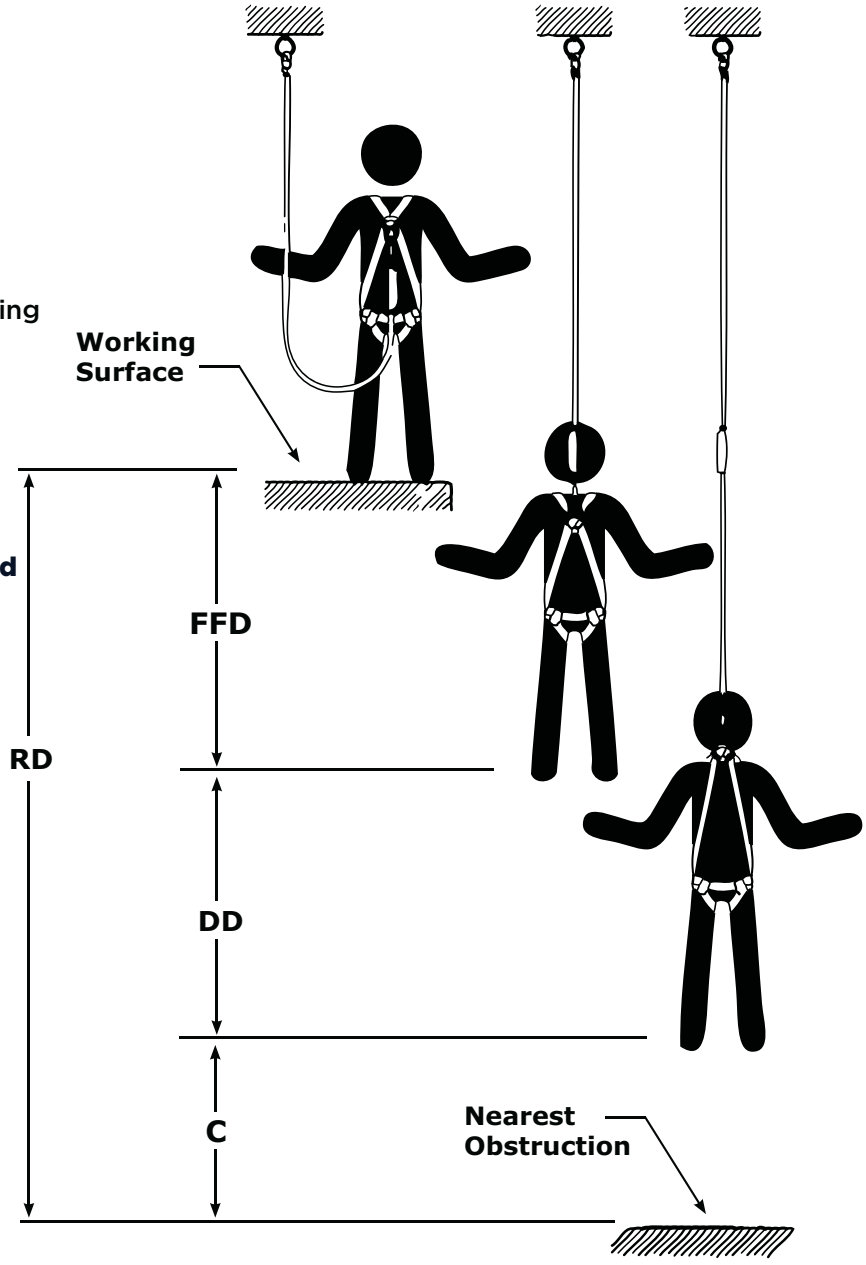
RD = Required Distance Below Working Surface to Nearest Obstruction

FFD = Free Fall Distance (2.0m maximum allowed)

DD = Energy Absorber Deceleration Distance
When using a DBI-SALA lanyard
(1.75m for users up to 136kg)
(1.95m for users from 136kg to 160kg)
+ D-ring Slide and Harness Stretch (0.25m)

C = Clearance to Obstruction During Fall Arrest (1.0m minimum safety factor required)

$$\frac{FFD + DD + C}{RD}$$



As per AS/NZS 1891.4, DD can be estimated based upon FFD in order to reduce RD.

FFD	Extension
600 mm	300 mm
1000 mm	500 mm
1500 mm	600 mm
2000 mm	900 mm

Fall clearance is the vertical distance needed to safely arrest a fall so that the worker does not hit the ground. To determine the required **Fall Clearance** add the appropriate factors together, this will give you the safe **Required Distance** (RD) below the working surface for work which is to be carried out where there is any risk of falling.

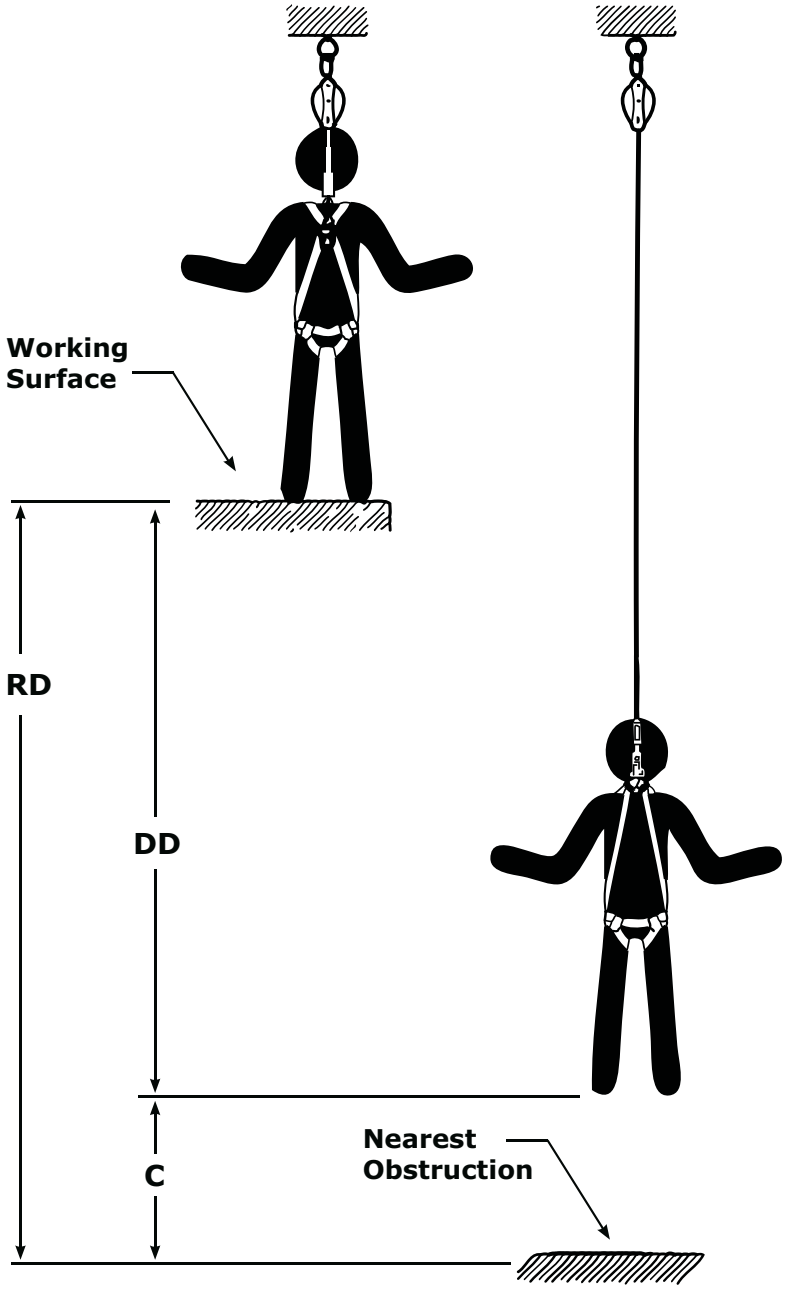
SELF RETRACTING LIFELINE FALL CLEARANCE CALCULATION

RD = Required Distance Below Working Surface to Nearest Obstruction

DD = Free Fall, Lock Off and Deceleration (1.4m Max.) + D-ring Slide and Harness Stretch (0.25m)

C = Clearance to Obstruction During Fall Arrest (1.0m minimum safety factor required)

$$\frac{DD + C}{RD}$$



As per AS/NZS 1891.4, DD can be estimated at 700mm. 250mm must be added for D-ring slide.

SWING FALL HAZARDS

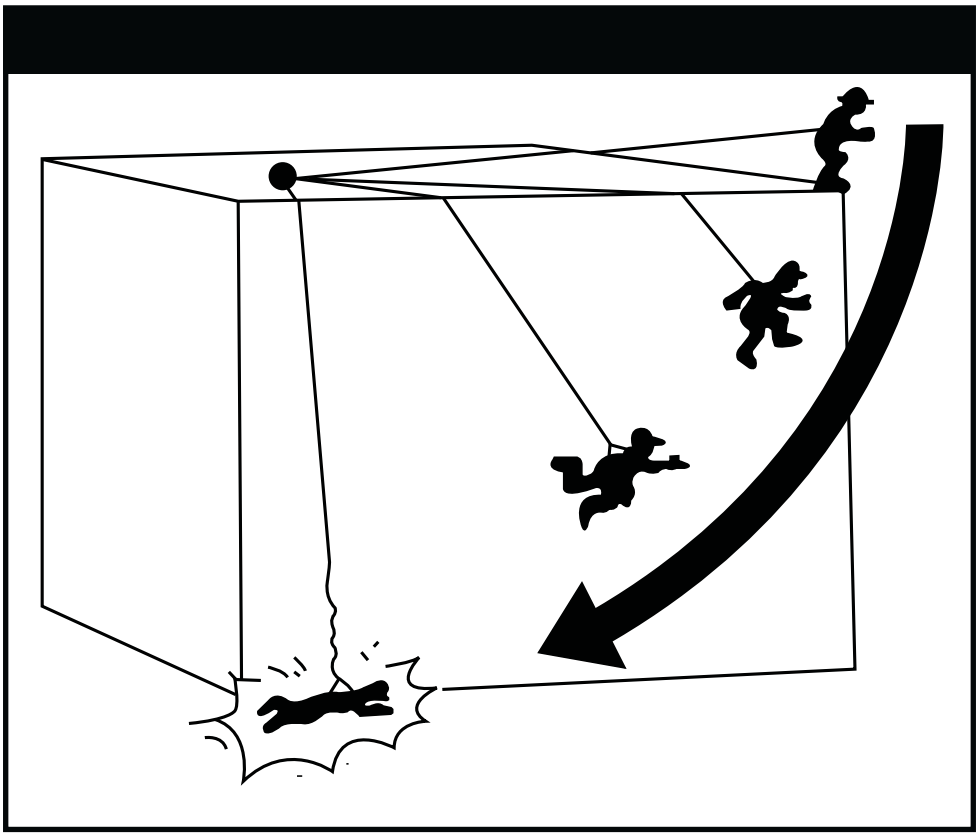
Swing Fall can occur when using a shock absorbing lanyard or self retracing lifeline (SRL) whilst working at height.

A swing fall is a pendulum-like motion that can occur when the operator falls and their connector device is in a position located horizontally away from the anchorage point. This is most likely to occur when connected to an anchorage point that is not positioned directly overhead.

Precautions to avoid this hazard include removing working slack from the rope working line, using restraint techniques and ensuring the person does not approach a leading edge such that they may be subjected to an unplanned fall.

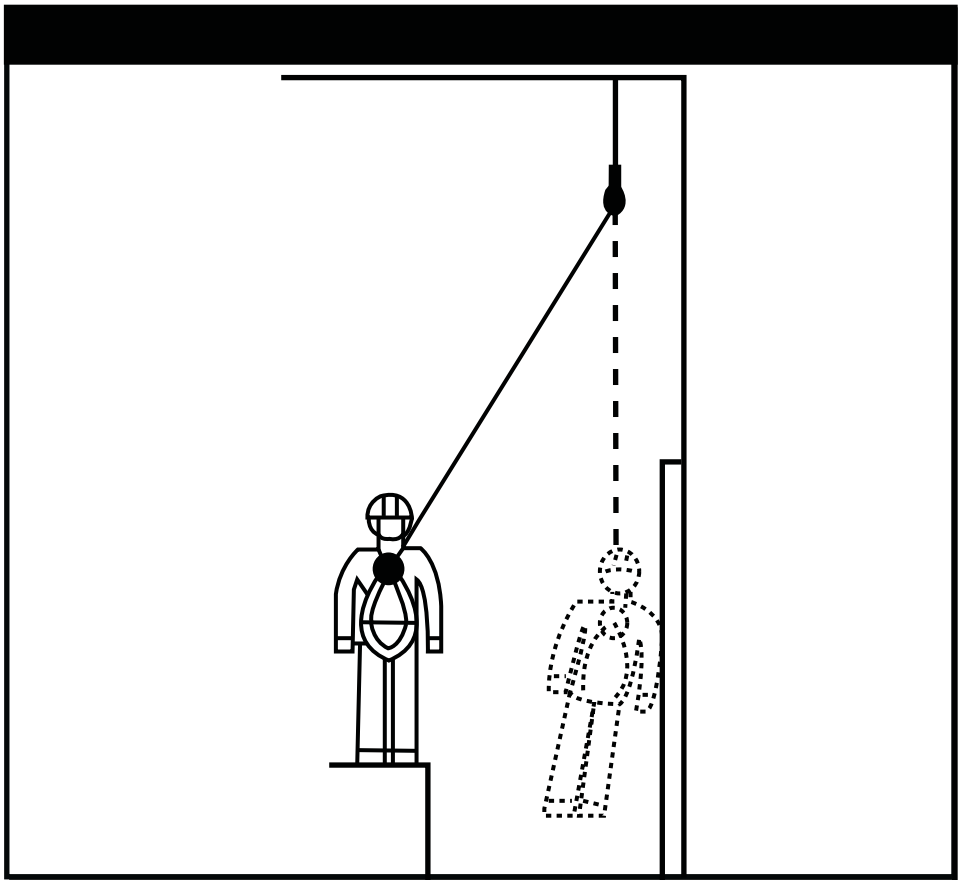
Operators should ensure they do not subject themselves to swing fall by taking measures to avoid the risk. Refer to Figure One and Two for examples of swing fall hazards.

FIGURE ONE: swing fall as a result of incorrect anchorage line positioning.



Note: It is important to position your anchor point directly overhead to minimise Swing Fall Hazards. Particular attention is required when using self retracting lifelines due to the extra mobility they provide.

FIGURE TWO: Self Retracting Lifeline swing fall.



Coming into contact with an object while swinging during a fall can lead to serious injuries.

INSPECTION & MAINTENANCE

As per AS/NZS 1891.4:2009 and manufacturer usage instructions, fall protection equipment users must carry out a full inspection on their gear before and after each use to ensure that the items are in good working order.

Items	Reference
Personal equipment including harnesses, lanyards, connectors, fall-arrest devices including common use devices	Clause 9.2
Harnesses, lanyards, associated personnel equipment	Clause 9.3.2
Fall-arrest devices (external inspection only)	Clause 9.3.4(a)
Ropes and slings	Clause 9.7
Anchorages—drilled-in type or attached to timber frames	Clause 9.3.3
Anchorages—other types	Clause 9.3.3
Fall-arrest devices—full service	Clause 9.3.4(b)
Horizontal and vertical lifelines: Steel rope or rail (Ladder Safety Systems)	Clause 9.3.5
Horizontal or vertical lifelines: Fibre rope, Webbing	Clauses 9.3.5 & 9.7
All items of personal and common use equipment	Clause 9.4
All items which have been stressed as a result of a fall	Clause 9.5

NOTES:
1. Manufacturer's or supplier's recommendations where provided, take precedence over the frequencies listed. Where used in harsh conditions, more frequent inspection may be required.
2. If the user or operator of the equipment is not competent to carry out this inspection it is to be undertaken by another person who is competent, see Clause 9.2.

Always remember: If in doubt, tag it out!

Inspection Frequency (Note 1)
Inspection by a Height Safety Operator and/or Height Safety Equipment Inspector (Note 2) before and after each use.
6 monthly inspection by a Height Safety Equipment Inspector (Note 3).
6 monthly inspection by a Height Safety Equipment Inspector (Note 3).
6 monthly inspection by a Height Safety Equipment Inspector (Note 3).
12 monthly inspection by a Height Safety Equipment Inspector (Note 3).
Up to 5 yearly inspection if recommended by the manufacturer. 12 monthly inspection is recommended by Capital Safety.
Up to 5 yearly service if recommended by the manufacturer. Capital Safety recommends: Type 1 - yearly, sealed type 2 and type 3 devices - two yearly, unsealed type 2 and type 3 - yearly.
Capital Safety recommends: 5 yearly inspection for systems installed by a Capital Safety accredited installer, all other systems - yearly.
6 monthly inspection by a Height Safety Equipment Inspector (Note 3).
Inspection by a Height Safety Equipment Inspector on entry or re-entry into service.
Inspection by a Height Safety Equipment Inspector before further use (Note 3).

3. All inspections other than those by the operator are to be documented.
4. Consult with local and state regulations as some inspection requirements for items such as anchor points may require more frequent inspection.

As recommended by Capital Safety, inspection scheduling for other fall protection equipment is given below.

Equipment	Before & After Use
Winches, Salalift I & II, Advanced	YES
Rescue Positioning Devices (RPD's)	YES
Rescue and Rescumatic Controlled Descent Devices	YES
Tripod, Davit Arms, Support Structures	YES

Records of inspections and maintenance must be recorded in an inspection and maintenance log maintained by the company.

Item to be Recorded	Harnesses, Lineworkers Body Belts & Assemblies	Lanyard Assemblies & Pole Straps
Manufacturer's supplier's or installer's name & address	YES	YES
Manufacturer's batch number	YES	YES
Serial or identifying number	YES	YES
Year of manufacture	YES	YES
Details of recommended connection to belts or harnesses	-	YES
Type of anchorage line to be used	-	-
Suitability & limitation on various usages	YES	YES
Date of purchase	YES	YES
Date first placed into service	YES	YES
Date & details of inspection & services	YES	YES

6 Monthly Height Safety Equipment Inspector	Service Period
YES	2 Year
YES	1 Year
YES	1 Year
YES	1 Year

Type 1 Fall-Arrest Devices Including Anchorage Line	Type 2/3 Fall-Arrest Devices	Mobile Attachment Devices	Fixed Anchorages, Horizontal Life Lines & Life Rails
YES	YES	YES	YES
YES	YES	-	-
YES	YES	YES	YES
YES	YES	YES	-
YES	YES	-	-
YES	-	-	-
YES	YES	YES	YES
YES	YES	YES	YES
YES	YES	YES	YES
YES	YES	YES	YES

TRAINING

"Because having the best equipment in the world doesn't help if you don't know how to use it."

"Training is essential in providing persons with the competence to successfully implement and comply with legislative obligations and to manage tasks while working at height." (AS/NZS 1891.4, Appendix E)

All users of fall protection/height safety equipment, or people taking part in harness-based work at heights, are required to be trained and assessed in accordance with the requirements of the standard, as set out below:

- Training and competency assessment conducted at 5 levels:
  1) Height safety theory
  2) Height safety operator
  3) Height safety supervisor
  4) Height safety equipment inspector
  5) Height safety manager
- Competency reassessment at appropriate intervals
- Records of training and competency shall be kept and recorded for each person trained

Capital Safety is accredited under VETAB to conduct the following nationally recognised training course:

- 91363NSW Course in safe work at heights

Capital Safety is also accredited to deliver the following nationally recognised competencies:

- RIIOHS204A Work safely at heights
- PUASAR004B Undertake vertical rescue
- MSAPMPER205B Enter confined space
- MSAPMOHS216A Operate breathing apparatus
- MSAPMOHS217A Gas test atmospheres
- MSAPMPER200B Work in accordance with an issued permit

Nationally Recognised Training

NEW! The theory component of the Height Safety Awareness unit of study is also available via Online Learning, for more information visit our website.

Capital Safety continues to provide training programs meeting the needs of end users and educating workers in the principles of working safely at height. Training of any kind should engage the participant and entice them to learn. By creating courses that demand active participation, the student becomes involved in the learning process increasing the information understood and their retention.

Please contact Capital Safety for further information and a list of training course licensees able to deliver this training.

Courses are available via open enrolment and onsite.

REGULATIONS & AUTHORITIES

RELEVANT REGULATORY AUTHORITIES & LEGISLATION

AUSTRALIA

Australian Capital Territory

Authority: WorkCover/WorkSafe ACT
Phone: 02 6205 0200
Website: www.ors.act.gov.au
Acts/Regulations/Codes of Practice:
Work Safety Act 2008
Work Safety Regulation 2009

New South Wales

Authority: WorkCover NSW
Phone: 13 10 50
Website: www.workcover.nsw.gov.au
Acts/Regulations/Codes of Practice:
Occupational Health & Safety Act 2000
Occupational Health & Safety Regulation 2001

Victoria

Authority: Worksafe Victoria
Phone: 1800 136 089
Phone: 03 9641 1444
Website: www.worksafe.vic.gov.au
Acts/Regulations/Codes of Practice:
Occupational Health & Safety Act 2004

Queensland

Authority: Workplace Health & Safety QLD
Phone: 1300 369 915
Website: www.dir.qld.gov.au
Acts/Regulations/Codes of Practice:
Work Health & Safety Act 1995
Workplace Health & Safety Codes of Practice 2005
Workplace Health & Safety Regulations 2008

South Australia

Authority: Safe Work S.A.
Phone: 1300 365 255
Phone: 08 8303 0400
Website: www.safework.sa.gov.au
Acts/Regulations/Codes of Practice:
Occupational Health, Safety & Welfare Act 1986
O.H & S Regulation 2010

Tasmania

Authority: Workplace Standards Tasmania
Phone: 1300 366 322
Phone: 03 6233 7657
Website: www.wst.tas.gov.au
Acts/Regulations/Codes of Practice:
Workplace Health & Safety Regulation 1998

Northern Territory

Authority: NT WorkSafe
Phone: 1800 019 115
Website: www.worksafe.nt.gov.au
Acts/Regulations/Codes of Practice:
Work Health (Occupational Health & Safety) Regulations 2006

Western Australia

Authority: Department of Commerce (Worksafe WA)
Phone: 1300 307 877
Website: www.worksafe.wa.gov.au
Acts/Regulations/Codes of Practice:
Occupational Safety & Health Act 1984
Occupational Safety and Health Regulations 1996

NEW ZEALAND

Authority: Department of Labour - Te Tari Mahi
Phone: 04 915 4400
Website: www.dol.govt.nz
Acts/Regulations/Codes of Practice:
Health and Safety in Employment Act 1992 (HSE Act)
Health and Safety in Employment Regulations 1995

RELEVANT STANDARDS

Fall Arrest Equipment

AS/NZS 1891.1 Industrial Fall Arrest Systems & Devices Part 1: Safety Belts & Harnesses
AS/NZS 1891.2 Industrial Fall Arrest Systems & Devices Part 2: Horizontal Lifeline and rail systems
AS/NZS 1891.3 Industrial Fall Arrest Systems & Devices Part 3: Fall Arrest Devices
AS/NZS 1891.4 Industrial Fall Arrest Systems & Devices Part 4: Selection, Use & Maintenance

Rope Access

AS/NZS4488.1 Industrial Rope Access Systems – Specifications
AS/NZS4488.2 Industrial Rope Access Systems – Selection, Use & Maintenance

Portable Ladders

AS/NZS 1892.1 Portable Ladders Part 1: Metal
AS/NZS 1892.2 Portable Ladders Part 2: Timber
AS/NZS 1892.3 Portable Ladders Part 3: Reinforced Plastic
AS/NZS 1892.4 Portable Ladders Part 5: Selection, Safe Use and Care

Scaffolding

AS/NZS 1576 Scaffolding
AS/NZS 4576 Guidelines for Scaffolding

Elevating Work Platforms

AS1418.10 Cranes, Hoists and Winches (Design)
AS2550.10 Cranes, Hoists and Winches (Use & Maintenance)

Platforms, Walkways & Stairs

AS1657 Fixed platforms, walkways, stairways and ladders – Design construction and installation

GLOSSARY OF FALL PROTECTION TERMINOLOGY

Anchorage
A secure point of attachment for lifelines or deceleration devices, e.g. lanyards & self retracting lifelines.

Anchorage Connector
Provides a connection point onto an anchorage or building structure in order to attach the rest of the fall arrest system.

Arresting Force
The force imposed upon the worker and the anchorage point the moment the fall arrest system stops the fall. It is measured in kilo newtons (kN), a maximum of 6kN is allowable.

Connector
A device used to join together components of a personal fall arrest system or parts of a component within the system.

Compatibility
Equipment is deemed compatible when they have been designed to work together in such a way that their size and shape do not cause them to separate inadvertently during use.

Competent Person
AS/NZS 1891.4 defines a Competent Person as: A person who has, through a combination of training, education and experience, acquired knowledge and skills enabling that person to correctly perform a specified task. Refer to Training Levels for detailed definitions of competency.

D-ring/Attachment Point
An attachment point on the harness which allows for the connection of other components of a fall protection/positioning system such as a lifeline or deceleration device.

Deceleration Device
Any device which utilises an energy absorption component to minimise the impact of the force created during a fall on the body, such as a lanyard or self retracting lifeline.

Double or Triple Action Device
A self-closing hook or karabiner with a keeper latch which will automatically close and remain closed until manually operated. These units have a minimum of two (double) or three (triple) distinct and deliberate consecutive actions to manually open them.

Fall Arrest Systems
Systems that protect the worker after a fall from hitting the ground and/or obstructions below the work platform.
Passive systems require little or no personal involvement from the worker.
Active systems require the worker to actively use the system in order for it to be effective. It is not always practical, cost effective or possible to employ passive systems. In these cases, a Personal Fall Arrest System is required.

Fall Indicator
A visual indicator that shows the fall arrest system or device has been used to arrest a fall.

Fall Prevention
Refers to the systems and techniques that eliminate the possibility of a fall to a lower level. The most desirable method of fall prevention is to engineer out or modify the work plan to eliminate the hazard.

Fall Protection
Refers to the overall industry and process of protecting workers at height.

Force
Measured in technical terms in Newtons (N). The weight of something in Newtons (N) is calculated by multiplying its mass in Kilograms (kg) by the value of Gravity, which is 9.81 (m/s^2). A Kilogram (kg) is a unit of mass (i.e. the weight of a static object). Force = Mass x Acceleration.
For rough calculation purposes:
1000N = 1kN, 1kN = 100kg, 10kN = 1000kg.

Harness (Full Body Harness)
A webbing assembly that is worn by the user to distribute the arresting forces throughout the body in the event of a fall. The unit is equipped with attachment points to connect it to other components of a personal fall arrest system.

Hierarchy of Control
The hierarchy of control is a sequence of options which allow you to control a hazard from the highest level of control to the least preferred option. These measures, in order, are: identification, elimination, substitution and isolation. If these are not practical, fall protection equipment must be used.

Horizontal Lifeline (HLL)/Rail System
A flexible line supported by two or more anchorages, to which workers can connect a lanyard or SRL and travel safely along the line length. HLL's can be designed for total restraint or fall arrest.

Karabiner
A connector with a self-closing gate that can be manually locked or that automatically locks, and is used to attach to a fall protection component. Can be double action or triple action.

Lanyard Assembly/
Shock-Absorbing Lanyard
A line of rope, webbing or cable incorporating shock absorber and connectors at each end to connect the harness to the anchor device.

Personal Fall Arrest Systems (PFAS)
A combination of components that when used together will arrest a person in a fall from a working level. A PFAS typically consist of: an anchorage, full body harness, connectors and a deceleration device such as a lanyard or SRL.

Pole Strap
A work positioning strap designed to be placed around a pole and attached at two points on each side of a line worker's fall arrest harness while the wearer is working on the pole.

Rescue
The ability to retrieve or rescue an individual from confined spaces or heights. Rescue must always be a component of any fall protection program.

Restraint Technique
Control on a person's movement by connection to an anchorage to physically prevent the person from reaching a position at which there is a risk of a free or limited free fall.

Risk Assessment
The evaluation of hazards within the worksite which have the potential to cause frequent serious injury or illness to occur.

Shock Absorber/Energy Absorber
A webbing device that is designed to tear or extend, to reduce the forces on the worker in the event of a fall to less that 6kN.

Snap Hook
A connector with a hook shaped body that has an opening for attachment to a fall protection component and a self closing gate to retain the component within the opening. Hooks must be double-acting to be compliant.

Sub-Pelvic Strap
A strap incorporated into a full body harness which passes under the buttocks connecting the two leg loops. It is designed to distribute the forces from the inside of the legs to the outside to lessen the effect of injury following a fall.

Total Restraint
Control on a person's movement by means of connection to an anchorage using non-adjustable equipment in such a way that it will physically prevent the person from reaching any position at which there is risk of a fall, either over an edge, through a surface or due to a failed moveable platform.

Training Levels (Levels of Competency)
Height Safety Operator - A person who is able to perform harness based work at heights under the direct supervision of a height safety supervisor.

Height Safety Equipment Inspector - A person who is competent in the skills needed to detect faults in height safety equipment and to determine remedial action.

Height Safety Manager - A person who is competent in the selection, design, manufacture or installation of height safety systems or equipment, or the development of control measures or work practices.

Height Safety Supervisor - A person who is competent in the skills needed to perform harness based work at heights, to supervise other operators including those at entry level and to participate in first response rescue.

Height Safety Theory - A person who has undergone training in height safety theory to a standard equal to that of a nationally accredited general height safety course for operators.

Type 1 Fall Arrest Device

Includes rope & rail grabs - A fall arrest device that travels along an anchorage line and, when loaded, locks to the line. The user is connected to the activating lever, which locks the device in the event of a fall. A typical use of a Type 1 device is as a ladder fall-arrest system, using a rigid rail or flexible line attached to the ladder.

Type 2 & 3 Fall Arrest Device - Self Retracting Lifeline (SRL)

A deceleration device containing a drum-wound line which may be extracted and retracted under slight tension when the user moves vertically away from and towards the device. In the event of a fall, the device will quickly lock the drum and prevent the lifeline from paying out, thus arresting the user's fall and limiting the force to 6kN. When incorporating a retrieval winch, it becomes a type 3 fall arrest device.

Vertical Lifeline System

A flexible line rigged from one or more anchors to which a worker can secure the components of their fall protection system in a vertical orientation. These systems provide freedom of movement whilst maintaining user protection from a fall from height.

Work Positioning

Use of fall protection components in a way that allows a worker to be supported in a harness under tension, so that a fall is prevented, e.g. the use of a pole strap.

WORKPLACE RESOURCES

POSTERS

This range of **free** educational posters will improve your understanding of fall protection and enhance your safety when working at height. To order, please visit www.capitalsafety.com.au and click on the TOOLS tab.

Absolute Confidence Poster: Your equipment comes from Capital Safety, the world's premier fall protection company. This poster demonstrates that you've chosen the very best.

Absolute confidence in fall protection
www.capitalsafety.com
1800 245 002 (AUS) 0800 212 505 (NZ)
fall protection experts:
| height safety | confined space | industrial rescue
capital
SAFETY

ABCD of Fall Protection: Fall protection need not be complicated. This A,B,C,D poster explains how to meet the basic requirements of a personal fall protection system.

The A B C D of Fall Protection
The A, B, C, D of Fall Protection covers the fundamental requirements of every personal fall protection system. Use it as a guide when evaluating your fall protection requirements, however, always consult a fall protection specialist if you're unsure of any aspect of fall protection or fall protection equipment.
A
ANCHORAGE
Anchorage devices provide a secure point of attachment (to an existing structure) for the fall arrest system. Anchorage devices can be permanent or temporary and vary to suit the type of structure available.
B
BODY SUPPORT
Full body harnesses connect the worker to the fall arrest system. They are specially designed to protect the worker against serious injury in the event of a fall whilst also remaining comfortable to wear.
C
CONNECTOR
Connectors are devices that connect the full body harness to the anchorage system. They can be single products or multiple devices working together.
D
DESCENT/ RESCUE
Decent & Rescue systems enable the retrieval of an injured or incapacitated worker. In the event of a rescue, this equipment facilitates rapid recovery of the worker without endangering other workers in the process.
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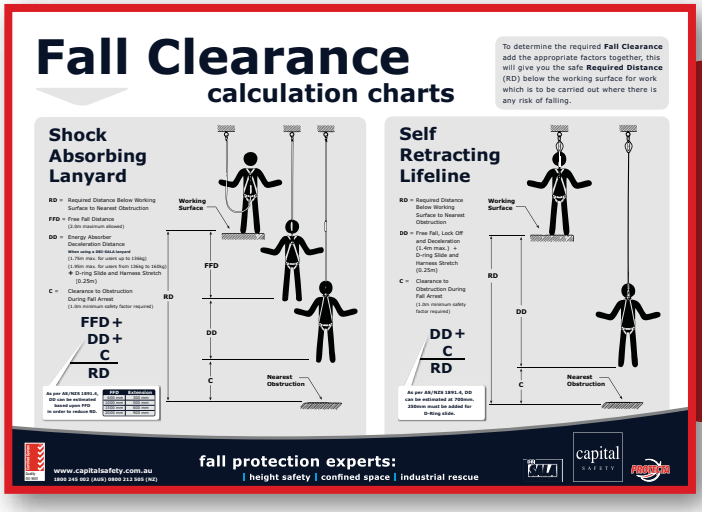
Fall Clearance
calculation charts
To determine the required Fall Clearance add the appropriate factors together, this will give you the safe Required Distance (RD) below the working surface for work which is to be carried out where there is any risk of falling.
Shock Absorbing Lanyard
RD = Required Distance Below Working Surface to Nearest Obstruction
FFD = Free Fall Distance (2.0m maximum allowed)
DD = Energy Absorber Deceleration Distance When using a SRD-SALA lanyard (1.75m max. for users up to 136kg) (1.00m max. for users from 136kg to 140kg) + D-ring Slide and Harness Stretch (0.25m)
C = Clearance to Obstruction During Fall Arrest (1.0m minimum safety factor required)
FFD + DD + C RD
As per AS/NZS 1891.4, DD can be estimated based upon FFD in order to reduce RD.
Working Surface
FFD
RD
DD
C
Nearest Obstruction
Self Retracting Lifeline
RD = Required Distance Below Working Surface to Nearest Obstruction
DD = Free Fall, Lock Off and Deceleration (1.4m max.) + D-ring Slide and Harness Stretch (0.25m)
C = Clearance to Obstruction During Fall Arrest (1.0m minimum safety factor required)
DD + C RD
As per AS/NZS 1891.4, DD can be estimated at 700mm. 250mm must be added for D-Ring slide.
Working Surface
RD
DD
C
Nearest Obstruction
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Fall Clearance:
Take the guesswork out of height safety. Use this poster to evaluate risks and safe operational distances. A few minutes of preparation can ensure you don't hit the ground before a fall is arrested!

Inspection & Maintenance
of fall protection equipment
Inspection and maintenance of fall protection equipment should be carried out by a Height Safety Equipment Inspector and records kept showing the inspection periods and re-entry into service. Manufacturer's instruction manuals should be read and inspection / service requirements understood in order to maintain the service life of the equipment.
INSPECTION & MAINTENANCE
As per Capital Safety and AS/NZS 1891.4, fall protection equipment users must carry out a full inspection on their gear before and after each use to ensure that the items are in good working order.
Always remember: If in doubt tag it out!
Records of inspections and maintenance must be recorded in an inspection and maintenance log maintained by the company.
PRODUCT LIFE
According to AS/NZS 1891.1, web products shall have a 10 year product life from the date of manufacture, after which the product must be removed from service. All other Capital Safety equipment, such as type 1 fall arrestors, type 2 and type 3 self retracting lifelines, can be used indefinitely, provided the equipment continues to pass the required inspections prescribed by the manufacturer and AS/NZS 1891.4.
Removal from Service
Capital Safety Group recommends the following regarding removal of equipment from service:
Any piece of equipment including both personal and permanently installed items, which has been used to arrest a fall shall be removed from service immediately. Any defect identified during operator or periodic inspections shall be withdrawn from service immediately and a replacement obtained if necessary. A label indicating the condition or defect must be attached to the equipment, and it should be examined by a competent person who will decide whether the equipment is to be destroyed or returned to the manufacturer or their agent for evaluation. Only the manufacturer or their agent may make repairs or alterations to any piece of height safety equipment.
In accordance with AS/NZS 1891.1, personal web products must be marked with a date by which they are to be taken out of service and destroyed (10 years from date of manufacture). The date is typically located on the product description label, adjacent to the certification label, or in the label pack.
As recommended by Capital Safety, inspection scheduling for other fall protection equipment is given below.
Inspection frequency requirements must be followed according to the standard, or the manufacturer's user instructions. The manufacturer may recommend more frequent inspection and recertification if the product is exposed to a harsh environment or rugged use.
Consult Capital Safety's user instruction manuals for further information.
AS/NZS 1891.4 defines a Competent Person as:
A person who has, through a combination of training, education and experience, acquired knowledge and skills enabling that person to correctly perform a specified task.
Competent Person Classifications:
Height Safety Operator - A person who is able to perform harness based work at heights under the supervision of a Height Safety Supervisor.
Height Safety Equipment Inspector - A person who is competent in the skills needed to detect faults in Height Safety equipment and assess its continued serviceability.
Height Safety Manager - A person who is competent in the selection, design, manufacture or installation of height safety systems or equipment, or the development of useful measures or work practices.
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Inspection & Maintenance:
Inspection and maintenance of your fall protection equipment is mandatory and essential for working safely at height. Condensed into a single poster, you can review inspection & maintenance needs at a glance.

Glossary
of fall protection terminology
Listed below is a collection of frequently used fall protection terms - for a more complete summary refer to AS/NZS 1891 (parts 1 & 4).
Anchorage
A secure point of attachment for lifelines or deceleration devices, e.g. lanyards & self retracting lifelines.
Anchorage Connector
Provides a connection point onto an anchorage or building structure in order to attach the rest of the fall arrest system.
Arresting Force
The force imposed upon the worker and the anchorage point the moment the fall arrest system stops the fall. It is measured in kilo newtons (kN), a maximum of 6kN is allowable.
Connector
A device used to join together components of a personal fall arrest system or parts of a component within the system.
Compatibility
Equipment is deemed compatible when they have been designed to work together in such a way that their size and shape do not cause them to separate inadvertently during use.
Competent Person
AS/NZS 1891.1 defines a Competent Person as: A person who has, through a combination of training, education and experience, acquired knowledge and skills enabling that person to correctly perform a specified task.
D-Ring/Attachment Point
An attachment point on the harness which allows for the connection of other components of a fall protection or positioning system such as a lifeline or deceleration device.
Deceleration Device
Any device which utilises an energy absorption component to minimise the impact of the force created during a fall on the body, such as a lanyard or self retracting lifeline.
Double or Triple Action Device
A self-closing hook or karabiner with a keeper latch which will automatically close and remain closed until manually operated. These units have a minimum of two (double) or three (triple) distinct and discrete consecutive actions to manually open them.
Fall Arrest Systems
Systems that protect the worker after a fall from hitting the ground and/or obstructions below. Fall arrest systems (or restraint systems) require little or no personal involvement from the worker. Active systems require the worker to actively use the system in order for it to be effective. It is not always practical, cost effective or possible to employ passive systems. In these cases, a Personal Fall Arrest System is required.
Fall Indicator
A visual indicator that shows the fall arrest system or device has been used to arrest a fall.
Fall Prevention
Refers to the systems and techniques that eliminate the possibility of a fall to a lower level. The most desirable method of fall prevention is to engineer out or modify the work plan to eliminate the hazard.
Fall Protection
Refers to the overall industry and process of protecting workers at height.
Force
Measured in technical terms in Newtons (N). The weight of something in Newtons (N) is calculated by multiplying its mass in Kilograms (kg) by the value of Gravity, which is 9.81 (m/s2). A Kilogram (kg) is a unit of mass (i.e. the weight of a static object).
Force = Mass x Acceleration.
For rough calculation purposes: 100N = 1kN, 1kN = 100kg, 10kN = 1000kg.
Harness (Full Body Harness)
A webbing assembly that is worn by the user to distribute the arresting forces throughout the body in the event of a fall. The unit is equipped with attachment elements used to connect components of a personal fall arrest system.
Hierarchy of Control
The hierarchy of control is a sequence of steps to eliminate or minimise the risk of harm from the highest level of control to the least preferred option. These measures, in order, are: identification, elimination, substitution and isolation. If these are not practical, fall protection equipment must be used.
Horizontal Lifeline (HLL) / Rail System
A flexible line supported by two or more anchorages, to which workers can connect a lanyard or SRL and travel safely along the line length. HLLs can be designed for total restraint or fall arrest.
Karabiner
A connector with a self-closing gate that can be manually locked or that automatically locks, and is used to attach to a fall protection component. Can be double action or triple action.
Lanyard Assembly/ Shock-Absorbing Lanyard
A length of rope, webbing or cable incorporating a shock absorber and connectors at each end to connect the harness to the anchor device.
Personal Fall Arrest Systems (PFAS)
A combination of components that when used together will arrest a person in a fall from a working level. A PFAS typically consist of: an anchorage, full body harness, connectors and a deceleration device such as a lanyard or SRL.
Pole Strap
A work positioning strap designed to be placed around a pole and attached at two points on each side of a line from the suspended harness while the wearer is working on the pole.
Rescue
The ability to retrieve or rescue an injured worker from a suspended or fall heights. Rescue must always be a component of any fall protection program.
Restraint Technique
Control on a person's movement by means of connection to an anchorage using non-adjustable equipment in such a way that a fall is prevented, or that the user is only reaching any position at which there is risk of a fall, either over an edge, through a surface or due to a failed movable platform.
Risk Assessment
The evaluation of hazards within the worksite which have the potential to cause frequent serious injury or illness to occur.
Shock Absorber/Energy Absorber
A webbing device that is designed to tear or extend, to reduce the forces on the worker in the event of a fall to less that 6kN.
Snap Hook
A connector with a hook shaped body that has an opening for attachment to a fall protection component and a self closing gate to retain the attachment point connection. Snap hooks must be double-acting to be compliant.
Sub-Pelvic Strap
A strap incorporated into a full body harness that passes between the user's buttocks connecting the two leg loops. It is designed to distribute the forces from the inside of the legs to the outside to lessen the effect of injury following a fall.
Total restraint
Control on a person's movement by means of connection to an anchorage using non-adjustable equipment in such a way that a fall is prevented, or that the user is only reaching any position at which there is risk of a fall, either over an edge, through a surface or due to a failed movable platform.
Type 1 Fall Arrest Device
Includes rope & rail grabs - A fall arrest device that travels along an anchorage line and, when loaded, locks to the line. The user is connected to the activating lever, which locks the device in the event of a fall. A typical use of a Type 1 device is as a ladder fall-arrest system, using a rigid rail or flexible line attached to the ladder.
Type 2 & 3 Fall Arrest Device - Self Retracting Lifeline (SRL)
A deceleration device containing a shock-wound line which may be extracted and retracted under slight tension when the user moves vertically away from and towards the device. In the event of a fall, the device will quickly lock the drum mechanism to arrest the fall user, thus arresting the user's fall and limiting the force to 6kN. When incorporating a retrieval winch, it becomes a Type 3 fall arrest device.
Vertical Lifeline Sytem
A flexible line rigged from one or more anchorages to which a worker can secure the components of their fall protection system in a vertical orientation. These systems provide freedom of movement whilst maintaining user protection from a fall from height.
Work Positioning
Use of fall protection components in a way that allows a worker to be supported in a harness under tension, so that a fall is prevented, e.g. the use of a pole strap.
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Glossary:
It's essential that you don't mistake anchorage for anchorage connector. There are many important terms relating to fall protection and this poster defines the fundamental fall protection principles and terminology.

Fall Protection Harness
inspection & fitting guide
EXOFIT NEX
DELTA
PRO
INSPECTION
1. Inspect the harness before use
VEST STYLE
CROSSOVER STYLE
BUCKLE TYPES
2. Getting Started
3. Sub pelvic strap
4. Leg Straps
5. Chest Strap & Waist belt
6. Final Adjustments
Consult user manual provided with all DBI-SALA & PROTECTA harnesses for complete information on donning, limitations, use and care. Contact Capital Safety with questions or to obtain a copy of the user instruction manual.
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Inspection & Fitting Guide:
A must-have poster wherever harnesses are used. This poster shows a step-by-step process of harness donning to ensure it's fit for service and being worn correctly.

ONSITE TRAINING

Capital Safety's training department offers its training programs at the client's site to all locations across Australia, depending on availability. By teaching in and around the workers normal environment, we are able to ensure that the issues discussed are immediately applicable to the students.

Whether the training is done in your warehouse, on a drilling derrick, or mine, Capital Safety offers all of its open enrolment courses, as well as many customised courses at your site through its licensee network. Not only is this often a great cost saving, but the training is tailored to your site and workers, and the hands-on scenarios actually resolve fall protection hazards in and around your facility.

SITE AUDITS

One of the biggest challenges facing many companies is understanding where the working-at-height risks exist on site and the types of measures that can be taken to minimise them. Whether you need an initial site assessment, site audit or full site survey, Capital Safety can provide guidance to your business to identify solutions to these measures. Contact us on 1800 245 002 (AUS) or 0800 212 505 (NZ) to see how we may be able to assist.

PRODUCT CATALOGUES

Our range of product catalogues are designed to provide a product overview as well as solutions based information to key industry segments and applications relating to height safety, confined space and industrial rescue. Our range of literature is continually updated to reflect up to date information and product innovations, visit our website or contact Capital Safety to obtain your copies.

MOBILE DEMONSTRATION UNIT

As part of our ongoing commitment to safety, Capital Safety offers extensive product and application tool-box talks and seminars across the country with our fleet of demonstration trailers.

Our Mobile Demonstration Units are fitted out with the latest fall protection equipment and systems that assist in the prevention of serious accidents or death in the workplace.

This is a complimentary service although availability is subject to demand. Contact us on +61 2 8753 7600 to arrange a booking through your local regional sales manager.

EQUIPMENT INSPECTION AND TAGGING

Recording the details of equipment inspection and maintenance can be a challenging task, particularly when there are large volumes of items in a fleet. Consideration should be given to electronic means of recording data, either by way of electronic spreadsheets or RFID (Radio Frequency Identification) tagging systems to enable the company to both store and retrieve information quickly, safely and easily. For more information about electronic tagging options, talk to our technical team.

EQUIPMENT INSPECTION CHECKLISTS

Your safety whilst working at height depends on effective inspection of your fall protection equipment, before and after use. Capital Safety has developed a series of comprehensive Equipment Inspection Checklists available at no cost from our website. Go to www.capitalsafety.com.au and simply click on the Tools tab to access and download your copy.

DBI SALA PROTECTA

WARNING: This booklet is a general reference guide and does not replace the requirement for competency based training.

FALL PROTECTION TRAINING

Nationally Recognised Training

Capital Safety is accredited under VETAB NSW to conduct the following nationally recognised training course:

- **91363NSW Course in safe work at heights**

Capital Safety is also accredited to deliver the following nationally recognised competencies:

- **RIIOHS204A Work safely at heights**
- **PUASAR004B Undertake vertical rescue**
- **MSAPMPER205B Enter confined space**
- **MSAPMOHS216A Operate breathing apparatus**
- **MSAPMOHS217A Gas test atmospheres**
- **MSAPMPER200B Work in accordance with an issued permit**

NEW! The theory component of the Height Safety Awareness unit of study is also available via Online Learning. For more information visit our website.

Capital Safety is a Registered Training Organisation (NTIS ID: 91276)

For course details or to book online visit

www.capitalsafety.com.au

or call

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